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Metal-Shearing Energy Absorber

A device consisting of a tongue of thin aluminum alloy strip, a pull tab, a slotted steel plate which serves as a cutter, and a steel buckle (see Fig. 1), absorbs mechanical energy when its ends are subjected to tensile loading. As the tensile load is applied, the aluminum alloy metal on either side of

curl up, absorbing additional energy, the amount of which depends on the width and radius of the curls. This version of the device is most effective when the shear strip is bent slightly so that the sheared outer strips roll up in opposite directions (not illustrated).

One possible application for the device is an

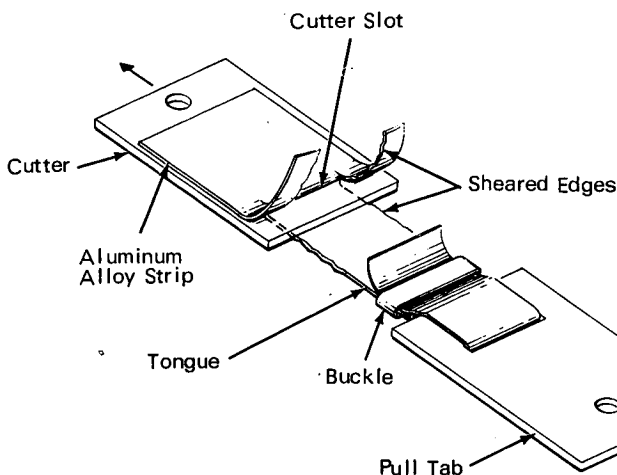


Figure 1

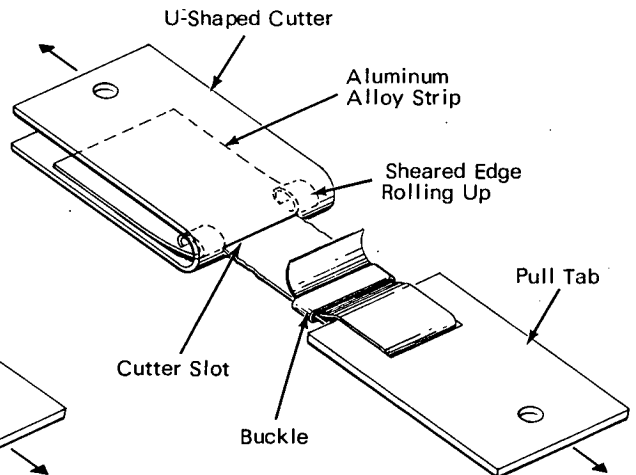


Figure 2

the tongue continuously shears away and the inner portion of the strip passes through the cutting slot. The mechanical energy dissipated depends on the material and thickness of the shear strip and on the duration of the applied tensile load.

In a second version of the device (see Fig. 2), the cutter is made by machining a central slot in a flat steel plate and then bending the plate into a U-shape. The action of this device is similar to that of the first version, except that the sheared metal edges

curl up, absorbing additional energy, the amount of which depends on the width and radius of the curls. This version of the device is most effective when the shear strip is bent slightly so that the sheared outer strips roll up in opposite directions (not illustrated).

Note:

No additional documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer
NASA Headquarters
Washington, D. C. 20546
Reference: B71-10503

(continued overleaf)

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to:

Patent Counsel

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